

1        The invention relates to a watch, in particular a wrist  
2 watch, comprising a housing, with a display and an interface ca-  
3 pable of being connected to an integrated electronic circuit.

4        Wrist watches with integrated electronic circuits are known  
5 in which certain data can be stored and outputted via the inter-  
6 face. For instance, under the name "LAKS Memory" there exists a  
7 wrist watch having an integrated electronic circuit which is  
8 provided with a USB (universal serial bus) interface. By con-  
9 necting the wrist watch to a computer, data can be transferred  
10 from the memory of the watch to the computer, and vice versa.  
11 Thus, the wearer of a wrist watch can carry certain data, such  
12 as, e.g., image data, music files or many other data, with him  
13 and retrieve them or alter them, respectively, by aid of com-  
14 puters.

15      Furthermore, wrist watches are known which comprise inte-  
16 grated electronic circuits and a transceiver unit so that cer-  
17 tain data can be transmitted and received, respectively, in the  
18 integrated electronic circuit. In this manner, the wrist watches  
19 may, e.g., be used for access to certain devices, such as ski-  
20 lifts, e.g.. For this purpose, the wrist watch is provided with  
21 an identification information in wireless manner, whereupon the  
22 wearer of the wrist watch will receive a certain time or a cer-  
23 tain number of accesses, e.g., to a ski-lift, e.g.. For in-  
24 stance, AT 391 375 B describes a data carrier for data traffic  
25 with at least one checking station which may, e.g., be config-  
26 ured as a wrist watch.

27      US 6,224,254 B1 shows a wrist watch which may be utilized as  
28 a cellular phone. For this purpose, a receptacle for the SIM  
29 card is arranged in the wristband of the wrist watch. To provide  
30 for a connection between the SIM card and the electronics con-  
31 tained in the housing of the wrist watch, an electronic connec-  
32 tion means is required which does not allow for a simple ex-  
33 change of the wrist band of the watch. Moreover, in order to  
34 avoid the SIM card from becoming damaged, the wrist band of the  
35 watch must be appropriately thick and resistant, which reduces  
36 the wearing comfort of the wrist watch.

37      The present invention has as its object to provide a watch  
38 of the above-indicated type, in particular a wrist watch, by  
39 means of which certain data can be transmitted in a safe and  
40 simple manner, which are, e.g., required for a cashless payment

1 transaction. In terms of appearance, the watch is to differ as  
2 little as possible from conventional watches.

3 The object according to the invention is achieved in that a  
4 receptacle for the integrated electronic circuit designed as an  
5 exchangeable chip with contacts arranged thereon is provided  
6 within the housing, the receptacle having elements for contact-  
7 ing the contacts of the exchangeable chip in its inserted posi-  
8 tion, wherein the contacting elements are connected to the in-  
9 terface and to a device for a contactless transmission of data.  
10 By a watch designed in this way, integrated electronic circuits  
11 designed as exchangeable chip can exchangeably be mounted within  
12 the watch and certain actions can be performed by means of the  
13 contactless transmission. For instance, the integrated elec-  
14 tronic circuit may be designed like the chips provided in credit  
15 or ATM cards, and thus the credit or ATM card function can be  
16 taken over by the wrist watch. The wearer of the watch need not  
17 carry a credit card on him, which may be particularly advanta-  
18 geous when doing sports. Via the interface, e.g. with the assis-  
19 tance of a computer, certain data can be transmitted into the  
20 integrated electronic circuit inserted in the watch, which data  
21 can be transmitted in contactless manner when required, thereby  
22 enabling access to something or initiating a payment transac-  
23 tion. Via the interface, it is, for instance, possible to load  
24 the exchangeable chip contained in the watch with a money amount  
25 similar to the "quick"-function on the ATM cards, whereupon pay-  
26 ment may be effected via the wrist watch in contactless manner  
27 at appropriately equipped cash registers. Since it is possible  
28 to exchange the integrated electronic circuit, it is not neces-  
29 sary to exchange the watch when changing the integrated elec-  
30 tronic circuit, e.g. when changing the credit card, it is merely  
31 necessary to insert a new exchangeable chip. This also opens up  
32 the possibility of a credit card function with the assistance of  
33 the watch, since by the simple exchange of the integrated elec-  
34 tronic circuit a higher safety is provided.

35 The transmission device advantageously is formed by an an-  
36 tenna. In this case, the electric energy required for the trans-  
37 mission is inductively in-coupled into the watch from the out-  
38 side via the antenna, in a manner known per se, so that the  
39 transmission of data will not be a load on the battery which,  
40 e.g., may be present in the watch for the watch work thereof.

1 Thus, it is also possible to use a mechanic watch work.

2 The receptacle for the integrated electronic circuit de-  
3 signed as an exchangeable chip may be configured as a chip card,  
4 in particular as a SIM (subscriber identity module) card. As is  
5 common in cell phone systems, the provider or the credit card  
6 enterprise may produce and sell the exchangeable chip in the  
7 form of an exchangeable chip that can be detached from a bank  
8 card. In this manner, e.g., a credit card enterprise can send  
9 the customer a plastic card with his name, from which the cus-  
10 tomer will break out the exchangeable chip and insert it in  
11 his/her watch. The exchangeable chip comprises the integrated  
12 electronic circuit which, as common on ATM or credit cards, con-  
13 tains the electronics required for the money transactions. Ad-  
14 vantageously, a name or identification is not contained on the  
15 exchangeable chip, thereby preventing any possible misuse. If  
16 the user loses the wrist watch, the finder cannot carry out any  
17 unauthorized transactions with the assistance of the exchange-  
18 able chip contained therein.

19 For as easy an exchange of the exchangeable chip as possi-  
20 ble, preferably an opening is provided in the housing, via which  
21 the exchangeable chip is insertable in the receptacle.

22 In this case, the opening in the housing preferably is clos-  
23 able by a flap, thereby protecting the contacting elements from  
24 dust or moisture. Provided there are appropriate sealing ele-  
25 ments, the watch may even be made water-tight in this manner.

26 Advantageously, an element for ejecting the inserted ex-  
27 changeable chip is arranged in the housing. This facilitates the  
28 removal of the exchangeable chip.

29 The ejection element may, e.g., be formed by a resiliently  
30 mounted pin.

31 According to a further feature of the invention, a display  
32 is provided in the watch which is connected to contacting ele-  
33 ments in the exchangeable chip receptacle. In this manner, cer-  
34 tain data stored in the exchangeable chip can be displayed via  
35 the display and thus, important information can be reproduced  
36 for the user. For instance, the display may show the credit of  
37 an electronic purse contained in the exchangeable chip.

38 Finally, also an actuating element, e.g. a key, can be pro-  
39 vided on the watch, which is connected to contacting elements in  
40 the exchangeable chip receptacle. In this manner, the integrated

1 electronic circuit in the watch can be influenced via the actuating element. A certain function may, e.g., be triggered by actuation of the actuating element.

4 The contacting elements contained in the receptacle for the exchangeable chip may be formed by preferably resiliently mounted pins. These pins contact the contacts present on the exchangeable chip and, on the other hand, they allow for a simple exchange of the integrated electronic circuit.

9 As an alternative or in addition thereto, the contacting elements may also be formed by spring elements. Such spring elements can be particularly easily produced by bent metal parts.

12 Advantageously, the contacting elements connected to the interface are arranged in the exchangeable chip receptacle on the opposite side of the contacting elements connected to the transmission device. In this way, an electronic circuit as known with SIM cards of cell phones can be used, which additionally has further contacts on its rear side for connection to the data transmission device for a contactless transmission of data.

19 The present invention will now be explained in more detail by way of the accompanying drawings of exemplary embodiments of the present invention.

22 Therein, Fig. 1 shows a top view onto a wrist watch designed according to the invention; Fig. 2 shows a partially sectioned rear view of the watch according to Fig. 1; Fig. 3 shows a block diagram of an embodiment of a watch according to the invention; Fig. 4 shows a method for transmitting the exchangeable chip for use in a watch according to the invention; and Figs. 5A and 5B show block diagrams for illustrating a use of the watch according to the invention.

30 Figs. 1 and 2 show a watch 1 which comprises a housing 2 with a display 3. The watch 1 may be designed in various ways. The housing 2 may be made of plastics or metal. The display 3 may be an analogue or digital display. Moreover, the watch may contain a mechanical or an electronic watch work. The watch 1 comprises an interface 4 which is capable of being connected to an integrated electronic circuit 5 provided in the housing 2. According to the invention, the housing 2 of the watch 1 contains a receptacle 6 for the integrated electronic circuit 5 which is designed as an exchangeable chip. The integrated circuit 5 designed as an exchangeable chip contains contacts 7 in a

1 similar manner as the contacts of an ATM card or credit card.  
2 The receptacle 6 contains elements 8 for contacting the contacts  
3 7 of the integrated electronic circuit 5. These contacting ele-  
4 ments 8 can be designed as resiliently mounted pins or spring  
5 elements in a similar manner as they are formed in cell phones  
6 for contacting the SIM card. According to the invention, the  
7 contacting elements 8 are connected to the interface 4 and to a  
8 means 9 for contactless transmission of data. Thereby, a trans-  
9 mission of data can occur from a PC into the integrated elec-  
10 tronic circuit 5 via the interface 4, e.g. a USB (universal se-  
11 rial bus) interface. In this manner, e.g., an identification  
12 following payment of a ticket for an event can be transmitted  
13 into the electronic circuit 5, which then, when entering the  
14 event, will be transmitted to a corresponding device at the en-  
15 try site at the location of the event via a transmission means 9  
16 formed by an antenna. Thus, the wearer of the watch 1 will be  
17 granted access to the event in a rapid and simple manner without  
18 a money transaction. For exchanging the integrated electronic  
19 circuit 5, an opening 10 is provided in the housing 2 of the  
20 watch 1, which may be formed in various ways. Via a flap (not  
21 illustrated), the receptacle 6 for the integrated electronic  
22 circuit 5 designed as an exchangeable chip as well as the con-  
23 tacting elements 8 can be protected from soiling and moisture.  
24 Furthermore, an element 11 for ejecting the inserted integrated  
25 electronic circuit 5 may be arranged on the housing 2 of the  
26 watch 1. This ejection element 11 can be formed by a resiliently  
27 mounted pin.

28 Fig. 3 shows a block diagram of the most important compo-  
29 nents of a watch 1 designed according to the invention. In the  
30 housing 2 of the watch 1, for instance a battery 12 and an elec-  
31 tronic watch work with a corresponding display 3 is contained.  
32 According to the invention, the receptacle 6 is provided for an  
33 exchangeable arrangement of an integrated electronic circuit 5  
34 designed as an exchangeable chip. The receptacle 6 contains con-  
35 tacting elements 8 for contacting the contacts 7 of the inte-  
36 grated electronic circuit 5. The contacting elements 8 are con-  
37 nected to the interface 4, a USB interface, e.g., and a device 9  
38 for the contactless transmission of data, e.g. via an antenna.  
39 Moreover, a display 13 may be provided which also is connected  
40 to contacting elements 8 in the exchangeable chip receptacle 6.

1 Thus, data contained in the integrated electronic circuit 5 can  
2 be displayed on the display 13. Likewise, an actuating element  
3 14 can be connected to contacting elements 8 in the exchangeable  
4 chip receptacle 6, whereby certain procedures in the electronic  
5 circuit 5 can be initiated by actuation of the actuating element  
6 14.

7 Fig. 4 shows a plastics card 15 in the shape and size of a  
8 credit card exhibiting spaces 16, 17 for the indication of a  
9 name or a number in the conventional manner. Furthermore, the  
10 card 15 may contain respective imprints 18 of the producer. In  
11 the card 15, the integrated electronic circuit 5 designed as an  
12 exchangeable chip is arranged and may be broken out of the card  
13 15, as is common with cell phones, and inserted in the recepta-  
14 cle 6 in the inventive watch.

15 Figs. 5A and 5B illustrate a use of the inventive watch 1.  
16 According to Fig. 5A, the watch 1 is connected to a personal  
17 computer 19 via the interface 4, and a transfer of data is car-  
18 ried out from the computer 19 into the electronic circuit 5 con-  
19 tained in the watch 1. In this way, an amount of money may,  
20 e.g., be loaded into the electronic circuit 5. According to  
21 Fig. 5B, a payment process is then initiated by holding the  
22 watch 1 close to a payment terminal 20, whereupon the required  
23 data will be transmitted in contactless manner to the payment  
24 terminal, via the transmission device 9 within the watch 1.

25 Of course, there are also other fields of application for  
26 the watch designed according to the invention.

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